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ABSTRACT

The conference described in this report convened to provide a forum for exchanging ideas and opinions on the role of the United Nations in global energy management. The conference was one in a series of international meetings (14 have been held to date) to consider how to increase the effectiveness of the United Nations during the 1980s. The objective of the report was to stimulate study, research, and education with respect to the role of the United Nations in achieving international peace and prosperity. Participants included diplomats, scholars, and energy experts from 17 nations. Conference deliberations focused on petroleum resources, price, and supply: electrical power generation: new and renewable sources of energy: conservation: national energy planning: and the role of the United Nations with regard to energy management. While there were differences in how participants viewed the nature and seriousness of the energy situation, there was broad consensus on many issues including that the era of cheap energy has ended, people must make a transition from petroleum to renewable energy sources, energy conservation is essential, major capital investment is essential to deal with the energy problem and to develop energy sources, and the role of the UN system should be to assist national governments and private sector organizations in planning for and implementing solutions to the energy problem. (DB)

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The United Nations and Energy Management

Fifteenth Conference on the
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of the
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Woodstock, Vermont, USA June 15-20, 1980

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Muscatine, Iowa 52761 USA

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Foreword

Twenty-five diplomats, scholars, and other energy experts from 17 countries gathered in Woodstock, Vermont, USA to discuss "The United Nations and Energy Management." Their deliberations, under the auspices of the Stanley Foundation,* included an examination of petroleum resources, price, and supply; electric power generation; new and renewable sources of energy; conservation; national energy planning; and the role of the UN system regarding energy management.

A variety of other topics concerning increased effectiveness of the United Nations were considered at 14 earlier conferences convened throughout the world. Participants have offered suggestions to encourage nation-states to maximize their participation in, and support of, the United Nations. The time focus of these conferences has been the next decade in order to avoid undue concentration on today's crises and unwarranted attention to utopian objectives.

Conference participants are knowledgeable about the United Nations and personally convinced that it needs to play a more decisive role in world affairs. They participate as individuals rather than as representatives of governments.

The format of this conference has been an informal, off-the-record exchange of ideas and opinions. The rapporteurs' report was prepared following the conference. Participants neither reviewed nor approved the report, therefore, it should not be assumed that every participant subscribes to all recommendations, observations, and conclusions. The rapporteurs have indicated participants' consensus, or lack of consensus, and accept full responsibility for content. The views contained in the report are not necessarily those of the Stanley Foundation.

The report is distributed in the hope that it will stimulate study, research, and education with respect to the United Nations and its vital role in achieving international peace and a better world. Additional copies of this report are available free of charge from the Stanley Foundation.

*See page 51 for description of Stanley Foundation activities designed to encourage study, research, and education in the field of foreign relations. Please note that the Stanley Foundation is not a grant-making organization.

The United Nations and Energy Management

Sponsored by The Stanley Foundation
Muscatine, Iowa 52761 USA

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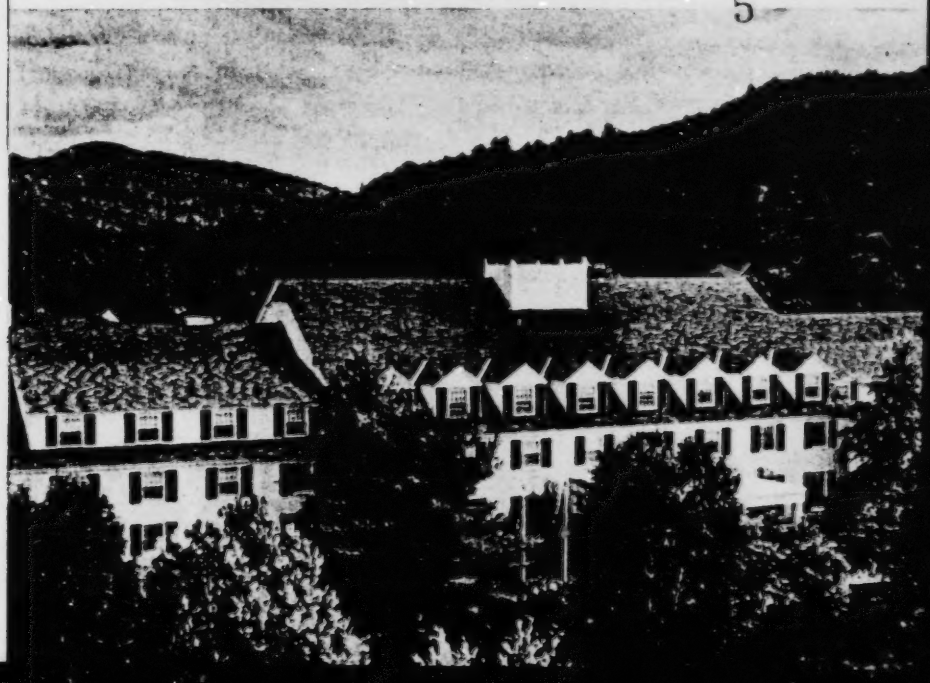
Woodstock Inn, Woodstock, Vermont, USA 1980



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Affiliations are listed for identification purposes only. Participants attend as individuals rather than as representatives of their government or organization.

Rapporteurs' Report

The United Nations and Energy Management

INTRODUCTION

This conference considered the serious energy problems facing the world community and the role of the UN system in dealing with energy.

There were differences in how participants viewed the nature and seriousness of the situation and the kinds and timing of possible solutions.

However, there appeared to be broad agreement among all or almost all of the participants on these basic conclusions:

1. The era of cheap energy has ended. Energy prices are likely to continue to rise, but the rate of increase is difficult to predict.
2. Two transitions are necessary. First, there must be a fairly rapid transition from the present high level of dependence on petroleum (and especially on imported petroleum) to greater use of other energy sources. The second and much longer-term change will be a shift from fossil and nonrenewable resources (petroleum, coal, uranium) to renewable energy sources (hydroelectric, geothermal, solar, biomass, etc.).
3. Increased conservation and energy efficiency measures are necessary and will aid both transitions.
4. Particular attention must be given to the energy and financial problems of the oil-importing developing countries and their need for dependable energy sources as a foundation for their economic development.
5. Major capital investment is essential to deal with the energy problem and to develop energy sources, both new and conventional. Because the capital requirements are so great, all available sources will need to be used and encouraged, including international, multilateral, bilateral, and private sources.

6. Energy planning must be part of the broader process of economic and development planning. Energy will be one important aspect of the Global Negotiations on international economic issues which will begin early in 1981. However, many constructive energy steps can be taken before completion of the Global Negotiations.
7. Energy planning requires a high degree of flexibility. The energy situation will continue to change rapidly. Rising energy prices make it economically feasible to utilize many energy resources, new forms of energy, and conservation measures which were previously too costly. Major technological breakthroughs may drastically change our expectations and plans for future energy sources. On the other hand, most new technologies or energy sources require a long lead time before large-scale commercial production can begin. Present data and conclusions on fossil fuel reserves are incomplete, controversial, and likely to change. For all these reasons, a broad, flexible approach and avoidance of "either-or" energy choices are recommended.
8. While the energy problem is serious and both transitions will be painful, there are reasons for optimism. With imagination and cooperation, energy decisions can be managed in ways that will enable a steadily growing world economy in which all nations and peoples can participate. The kinds of energy used to achieve growth will change, but a "no-growth" economy is unacceptable and unnecessary.
9. The role of the UN system should be to assist national governments and private sector organizations in planning for and implementing solutions to the energy problem. The UN role in the foreseeable future will not include energy management in the sense of decision-making. These decisions will be made by national governments, by private enterprises in market economies, and by regional or cooperative organizations which they may create. However, the UN system role is a vitally important

one, especially in coordination, information gathering and dissemination, technical assistance, training, and financing. The UN system can do much to enable the inevitable transitions to be made in orderly and positive ways.

10. Any progress toward reducing or limiting the arms race and relieving the heavy burden of military expenditures would aid solutions to the energy problem — by freeing funds for energy investment, releasing scientists and engineers for work on energy projects, and improving the climate for international cooperation on energy.

PETROLEUM RESOURCES: PRICE AND SUPPLY

The participants' views of oil price movements since 1972, and the reasonableness of current price levels, differed widely.

However, most participants agreed that rising oil prices should be regarded as a "given" and that the price of this finite resource must continue to rise in order to encourage conservation and the transition from oil to other energy sources. It was noted that oil as a percentage of total world energy consumption is steadily declining.

Many participants urged an effort to reach agreement among oil-exporting and oil-importing nations on assured supplies and predictable prices. It was stated that oil prices will continue to rise, but that steady, predictable price increases will be less harmful than price shocks and unpredictable gyrations. Predictable (steadily rising) prices would encourage a wide variety of energy investments by reducing the uncertainties, and would increase the likelihood of stable world economic growth. Developed countries whose economies are growing are more likely to increase financial aid to developing countries.

Some participants said that the free interplay of market forces should be allowed to determine oil prices; the Organization of Petroleum Exporting Countries (OPEC) should not set minimum prices; and there should be no stockpiling beyond normal levels. It was

stated that these policies would tend to eliminate the spot market demand. However, it was noted OPEC members contend that their oil pricing policies are reasonable and are necessary to encourage conservation of this valuable resource and a shift toward other energy sources. Also, many oil-exporting countries have chosen to limit their production, both to extend the life of their depleting oil assets and to limit their oil income to manageable amounts.

It was agreed that oil prices will continue to rise over the long term, whether as a result of international agreements on price and supply, OPEC pricing policies, or market forces.

The severe financial problems of many oil-importing developing countries were noted, though the participants did not agree on the extent to which these problems are caused by oil imports.

The oil-importing developing countries need financing for at least two oil-related purposes. They need continued financing of their large balance of payments deficits, preferably with a shift to longer-term financing to give these countries time to overcome these deficits. These countries also need capital investment in developing their own energy resources, both to increase their economic development and to reduce their oil imports and balance of payments deficits. Both kinds of financing are discussed below.

It was agreed that it would not be desirable to sell oil to developing countries at less than the world price, because this would delay the necessary transition to other energy sources and conservation measures. However, some participants suggested that oil-exporting countries should allow extended payment and other favorable terms, especially to the least developed countries, and should assure that they are able to buy at the stated price rather than higher spot market prices.

Oil-importing developing countries are a highly diverse group, with widely differing energy and economic situations, and these differences must be taken into account in assisting these countries.

Any attempt to reach agreement on oil price and supply is closely related to, and will be affected by progress

in, the Global Negotiations on economic issues.*

Most participants agreed that the UN system will probably have only a small role in the sensitive questions of oil price and supply management. The United Nations can provide a forum for discussion and can encourage negotiations. Several UN system agencies are involved in financial assistance and technical assistance; their roles should increase, as discussed below.

It was agreed that one of the UN system's most needed functions is the collection and dissemination of factual data and analyses on petroleum and the worldwide energy situation. Many participants emphasized the need for a reliable data base, so discussions can begin from a set of accepted facts and figures.

PETROLEUM: INCREASED PRODUCTION

It was agreed that there should be a major worldwide effort to find and develop additional deposits of oil and natural gas and to apply enhanced recovery methods to previously developed oil and gas fields. Rising energy prices increase both the need for and the economic feasibility of these efforts.

It is especially important that the oil-importing developing countries develop their own energy resources, including any oil or gas deposits. This will help them overcome their balance of payments problems and provide needed energy for their economic development. However, additional oil and gas production anywhere in the world will help make the necessary transition more gradual and less painful.

The participants were generally optimistic about prospects for significant new oil or gas production in most developing countries. It was stated that worldwide use of existing technology could lead to sharp increases in production.

Large amounts of capital, far beyond existing resources, will be required to increase oil and gas production in the oil-importing developing countries

Eleventh Conference on United Nations Procedures Report, "Global Negotiations and Economic Development," The Stanley Foundation, May 1980.

and to build the needed infrastructure to support petroleum exploration and development.

In view of these major capital investment requirements, it was agreed that substantial increases are needed in all existing sources of capital: International Bank for Reconstruction and Development (World Bank), other international institutions, OPEC, other multilateral sources, bilateral assistance, and private investment.

Some participants emphasized the importance of action by national governments to create a favorable climate for private investment in oil and gas exploration and production, including appropriate incentives. Drilling decisions are strongly influenced by the likelihood that if oil is discovered, it can be produced and marketed and profits can be withdrawn. Assurances against nationalization are important. Some countries that have opposed private sector oil exploration are changing these policies because of high oil prices and the need for equipment and capital. The helpful role of the World Bank in encouraging cooperation between oil companies and host countries and in overcoming mutual suspicions was noted.

Cooperative ventures between oil-exporting countries and oil-importing developing countries were recommended. Some OPEC members provide technical assistance and financing for petroleum exploration and production in developing countries, and further action of this kind will be helpful.

It was agreed that the UN system and other international institutions should have a major role in helping oil-importing developing countries to increase their oil and gas production. The World Bank, United Nations Development Programme (UNDP), United Nations Institute of Training and Research (UNITAR), United Nations Industrial Development Organization (UNIDO), the UN Department of Technical Cooperation for Development, the regional development banks, and other agencies and institutions have significant roles which need to be expanded.

UN system involvement in technical assistance, training, surveys, exploratory drilling, financial assistance, and encouraging capital investment by private and

other sources, should be increased.

Some examples of successful programs which should be expanded are the Division of Natural Resources and Energy's short-term missions to help identify opportunities for petroleum exploration and development and its neutral review of proposed contracts for exploration and development; the UNDP's financing and review of pre-exploration surveys and its advice on terms of competitive bid lease auctions; the World Bank's financing role, both directly and as a catalyst for capital investment from other sources; the World Bank's "honest broker" function in aiding cooperation between oil companies and host countries; and the Inter-Amercian Development Bank's plan to finance petroleum exploration on the entire Latin American continental shelf.

The future role of the UN system is discussed more fully below.

ELECTRIC POWER GENERATION

The participants agreed on the great importance of increasing the generation and use of electric power, especially in the developing countries. The growth rate of world electric power consumption has slowed in recent years. It is difficult to predict the future trend. It seems probable that reliance on electric power will continue to grow, though rising electric rates and conservation measures are likely to limit the growth rate.

Two transitions, already underway, are necessary and should be encouraged:

1. There should be a continuing shift toward electric power, and away from burning oil or gas, to meet stationary energy needs (industrial, heating and lighting of buildings, etc.). Also, additional energy should be obtained by using presently wasted exhaust heat from electric power plants.
2. The trend to generate electric power from energy sources other than oil and gas should continue. Primary energy sources for this purpose in the next 20 years should be coal, hydroelectric, and, in the opinion of most participants, nuclear. However, most energy sources, including the new and renewable sources discussed below, are capable of being used to generate electricity. As renewable energy sources become commercially feasible, they should gradually replace fossil fuels for electric power generation.

Coal

Participants differed on the probable extent of coal reserves outside the three nations (China, Soviet Union, United States) which are known to have large coal deposits. However, there was agreement that some nations have enough coal to satisfy a major part of their energy needs during the transition to renewable energy sources. A significant number of developing countries can reduce their dependence on imported oil by developing their coal deposits. This coal should be used primarily to generate electricity.

Most of the discussion above on additional petroleum resources applies with equal force to coal. Large amounts of capital, from a variety of sources, will be required. Some countries need financing to provide the necessary infrastructure to support mining and transportation of coal. Substantial capital may also be required for environmental protection related to increased use of coal.

Hydroelectric Power

The importance of prompt development of the remaining suitable sites for hydroelectric power generation, especially in the developing countries, was emphasized. Small generating plants may be especially important in rural areas. In connection with development of hydroelectric sites, industries which require large amounts of electric power should be encouraged to locate near these sites.

Various parts of the UN system are already doing useful work in identifying and evaluating hydroelectric sites, providing or helping to arrange financing, and assisting nations to reach agreement on joint use of border hydroelectric sites. The latter role is particularly important, because many of the best remaining sites are shared by two nations, or located in a country that does not yet need the electric power that could be used in a neighboring country (e.g., Nepal and India).

Nuclear Power

Most but not all participants concluded that substantial use of nuclear power to generate electricity will be necessary during the transition to renewable energy sources. Most participants believed that nuclear power will be an important energy source for a small, but growing and significant, number of developing countries by the year 2000.

The effective work of the International Atomic Energy Agency (IAEA) in assisting the peaceful use of nuclear power was noted.

It was suggested that the UN system should be a source of factual information and impartial studies on nuclear power and that these may tend to increase public acceptance of nuclear power in those nations where it is now controversial. The urgency of safeguards against proliferation of nuclear weapons was noted.*

Interconnection

One of the greatest needs is for more international cooperation in connecting electric power transmission lines across national borders and developing regional electric power grids. The timing of peak loads varies among countries, especially those in different time zones, and interconnection can provide both cost savings and greater assurance of available power.

The UN system, particularly the UNDP, is already involved in development plans that include interconnection and regional grids. The UN system should have a growing role in assisting nations to agree on these measures. Nations should be encouraged to avoid the mistake of relying solely on their own electric power plants. Progress toward a more peaceful and stable world will encourage greater international cooperation in this area.

Impartial Evaluation and Research

Several participants suggested that the UN system should sponsor an impartial evaluation of all energy sources available for electric power generation, including nuclear power, and their comparative advantages and disadvantages. The IAEA's efforts to coordinate international research on electric power generation were noted.

Vantage Conference Report, "Nonproliferation: 1980s," The Stanley Foundation, February 1980.

NEW AND RENEWABLE SOURCES OF ENERGY

Sources and Potential

New and renewable sources of energy are of growing interest to many governments and organizations including the United Nations. These sources, as specified in the UN General Assembly resolution on the 1981 Conference, include solar, geothermal, wind power, tidal power, wave power, thermal gradient of the sea, biomass conversion, fuel wood, charcoal, peat, energy from draught animals, oil shale, tar sands, and hydropower.

The participants agreed that as remaining supplies of fossil fuels are consumed and their prices continue to rise, a number of new and renewable energy sources will become economically feasible. It is difficult to predict the rate of this change or the particular energy sources which will be the ultimate primary replacements for fossil fuels.

New and renewable sources now contribute only a small percentage of global energy production. By most projections, they will not constitute a major proportion in the near future; some estimates call for ten percent of the global total by the year 2000. Many participants view new and renewable sources of energy as having highest near-term utility in rural areas of developing countries, with conventional fuels continuing to supply urbanized and industrial sectors in both developed and developing countries for many decades.

New and renewable sources can be of significant benefit in particular circumstances. Some have particular relevance to homes, industries, or small towns; others are better suited for wider application. For larger applications, various participants suggested that biomass, geothermal, and hydroelectric power may be of primary importance.

It is important that governments make realistic assessments of the contribution new and renewable sources can make to their overall energy mix. Where

these sources can be economically used, they should be encouraged and utilized. In order to do this, it will be necessary to overcome prevailing obstacles and institutional inertia. Money, talent, and information should be organized for the development of new and renewable energy sources. While principal responsibility must remain with national governments, the United Nations can exercise important educational and research functions.

1981 UN Conference on New and Renewable Sources of Energy

The UN General Assembly, in resolution 33/148 of December 20, 1978, called a United Nations Conference on New and Renewable Sources of Energy. The Conference will take place in Nairobi, Kenya, July 21-August 1, 1981. The objective of the Conference is to elaborate measures for concerted action to promote development and utilization of new and renewable energy sources to meet future energy requirements, particularly those of developing countries.

The 1981 Conference will be the first major intergovernmental conference dealing with technical, scientific, and political aspects of new and renewable energy utilization. The Conference should help stimulate the transition from the current energy system with its near total reliance on conventional energy sources to a more mixed system in which new and renewable sources have important roles. The emphasis should be on those new and renewable energy sources which will be economically feasible and relevant to the practical needs of nations in the next 10 to 15 years. Particular attention should be given to what the UN system can contribute.

The Conference is important to the future vitality of the United Nations. Because it focuses on an area of considerable interest to both developing and developed countries, it has the potential to make a large contribution. However, if the Conference becomes the focal point of further North-South confrontation, it may breed added cynicism and disdain for the United Nations in many countries.

Participants stressed the extreme importance of careful and adequate preparation. Preparatory activities extend over two years and will set the foundation for decisions to be made in the 12-day Conference. This will also be an important educational process for governments and will promote awareness of both the opportunities and obstacles in the field of new and renewable energy sources.

Preparation is being undertaken in part by eight technical panels of experts as well as two specialized studies. The panels will provide valuable technical and scientific information which can be synthesized by the Secretariat and used by the Conference participants.

In addition, six ad hoc groups of experts will undertake studies cutting across the technical panels on such issues as finance, information flow, technical transfer (research, development, and training), industrial issues, rural energy, and energy storage. When the work of the technical panels and ad hoc groups is complete, an integrated final report will be prepared for submission to the Preparatory Committee and the Conference. The Committee on Natural Resources (CNR), and intergovernmental body which is part of the Economic and Social Council (ECOSOC), serves as the Preparatory Committee and provides overall guidance with particular emphasis on developing countries' preparations for the Conference.

Participants drew attention to several important objectives and potential benefits of the 1981 Conference. The Conference can provide a competent international assessment, resulting in a great deal of valuable information on new and renewable sources of energy. This information will be available to many nations which may not take part in purely technical or scientific conferences on similar topics.

Many participants urged that the Conference highlight the economic, technical, and environmental restraints on introduction of new and renewable energy sources (particularly in developing countries) and identify feasible and desirable options for overcoming these restraints. The Conference should also provide an inventory of the current energy activities of the UN system

and related organizations and suggest measures for better coordination. This should include an analysis of current programs for research and development, data collection, and personnel training. The Conference should suggest sound cost-efficient programs for enhancing national programs in these areas.

An important objective of the Conference will be to heighten governments' awareness of opportunities for inclusion of new and renewable energy sources in national energy programs. Related to this is an important global educational or popularization process which will result from both the preparation and the Conference. The Conference may also suggest ways to hasten the commercial utilization of new and renewable forms of energy and ways to make these sources available to developing countries on favorable terms.

Most participants agreed the Conference should result in some kind of new framework within the UN system to provide support for national efforts on new and renewable energy sources. A new and separate UN organ was not favored at the present time by most participants. One element of a UN framework for new and renewable energy sources might include a centralized capacity for collecting and disseminating information within the UN system and to governments. Another aspect might be to identify sources of funding available within the UN system for new and renewable sources.

In the longer term, some participants favored a new energy institution within the UN system, including new and renewable sources. A special fund designed to assist developing countries in the study and application of new and renewable sources was suggested by some participants.

Finally, many participants stressed the important linkage between the UN Energy Conference and the Global Negotiations on economic issues scheduled to begin in 1981. It was noted that energy is one of the key issues that will be considered in the Global Negotiations. The Global Negotiations will include energy in its political context (prices and supply of petroleum, etc.) and in relation to wider North-South issues. The 1981 Conference should focus primarily on the scientific and technical aspects of new and renewable energy sources.

The two efforts can be complementary: rapid progress in the Global Negotiations could aid the success of the 1981 Conference. Alternatively, lack of any progress in the Global Negotiations could create an unfavorable climate for the 1981 Conference.

CONSERVATION

It is important for nations and their citizens to make a strong commitment to conservation of both petroleum resources and electrical energy. There are many factors which argue for conservation efforts, including the finite supply of the most important conventional sources and the fact that the current rate of consumption growth exceeds many estimates of the probable growth rate of total energy supply.

Regarding petroleum, many oil producing countries have decided to limit production, and IAEA projections foresee demand for oil by 1985 exceeding supply by between 2.1 million barrels and 3.7 million barrels per day, depending on economic growth and conservation. Another factor supportive of conservation is the unpredictability of supplies due to political and technical factors.

Some industrialized nations have achieved an actual decrease in energy consumption. This decrease is due in part to gains in energy efficiency, particularly in the transportation and industrial sectors, but may be partially the result of reduced economic growth. However, many participants emphasized that a significant part of the energy problem continues to be the consumption patterns of the industrialized nations. More extensive and rapid advances in efficiency and conservation must be achieved to avoid greater problems in the future.

While most participants agreed that primary conservation efforts should be undertaken by the developed countries and their citizens, some emphasized that progress can also be made in developing countries. While developing countries will inevitably need to increase their total energy consumption, they can avoid the mistakes of the industralized nations by emphasizing efficiency in energy utilization.

Some participants suggested that rising energy prices have accomplished more than laws or regulations in encouraging energy conservation and said that allowing energy prices to rise to the world price level, without government controls or subsidies, is one of the best conservation measures.

Some participants stressed the difficulty of an accurate measurement of conservation efforts. The cost of conservation will differ considerably depending on the sources of energy, location, environmental considerations, and other factors.

The UN system is making a greater commitment to conservation. UNIDO has emphasized conservation to a greater degree than other UN organs, with particular emphasis on the industrial sector. The UNDP has carried out projects for the regional development banks and has undertaken studies on conservation issues. The International Monetary Fund (IMF) has emphasized national conservation plans as part of the repayment phase of its financing programs. The World Bank has given enhanced attention to conservation through studies of alternative energy sources and by significant increases in lending for wood management and reforestation. The Food and Agriculture Organization (FAO) is also assisting in developing more efficient ways of clearing land so as not to adversely affect its productive capacity.

A subject of particular concern to many participants was rapid deforestation in many developing countries. The rise in fuel costs has led to a shift from kerosene to wood as a principal source of energy in many developing countries. This is having a devastating impact on those countries' forests and perhaps ultimately on the world environment. While noting the useful work of the World Bank and the FAO, participants believed the UN system should do far more to assist countries by collecting and distributing information about the adverse effects of deforestation and by providing assistance in reforestation and in identifying alternative energy sources.

Participants supported greater emphasis, through the UN system, on conservation as a desirable goal for all

countries. All UN units and their programs can encourage greater sensitivity to the need for conservation. Harmonization of information systems will enhance cooperative efforts within the UN system. Another need is for post-project appraisal and exchange of information on conservation among UN agencies, an approach found effective by the Development Action Committee of the Organization for Economic Cooperation and Development (OECD) countries. Finally, it was emphasized that the 1981 UN Energy Conference will provide a major opportunity for the United Nations to promote conservation and the most efficient use of appropriate energy sources.

NATIONAL ENERGY PLANNING

National energy planning means rational utilization of available energy sources in support of the development process. All countries and their citizens have responsibility and a strong incentive for energy planning. Energy planning is viewed as a continuing and flexible process. It is desirable for countries to design the necessary institutional machinery to analyze and utilize energy options as part of the overall development program.

National energy planning can be described as a process whereby a country (1) determines its needs, (2) carries out an appraisal of available resources, (3) determines the best means to develop the energy resources (or alternatively to import them), and (4) organizes or obtains the necessary skills and financing from internal sources (including the private sector) and from international sources as needed.

Participants stressed the importance of linking the national energy program to the overall development plan, in view of the long lead times involved in energy planning. For many energy sources five years, the typical length of a development program, is insufficient. Therefore, energy plans should be flexible and long-term, using a rolling term of years and frequent updating. The energy goals should be periodically revised and correlated with the ongoing development program.

For developing countries, participants agreed the

foundations of a sound energy program are early identification of their available energy resources and a careful analysis of the costs of exploitation, including proximity to major centers of consumption. In order to do this, developing countries must have the necessary infrastructure. Therefore, a principal objective for developing countries is to strengthen their training and education facilities and their ability to collect and disseminate important information relating to national energy management. Some participants stressed the important role of foreign assistance, including services available from private enterprise and international organizations, and the experiences found successful by socialist countries.

Good internal coordination of public and private organizations dealing with energy is of critical importance. Many participants said developing countries should have a high-level energy office — a clear focal point for energy policy — situated in close proximity to the highest policymakers. This will help the entity responsible for energy to coordinate the various national energy efforts and assure that they complement the national development program. This energy office can also better relate to, and maximize benefits available from, international organizations offering assistance in energy development.

Many participants, while recognizing the need for a coordinating unit for national policy planning, stressed the importance of the private sector. The national energy authorities should adopt essential policies but should avoid over-regulation, and the private sector should have a leading role in implementation of energy policy. Participants agreed that situations will vary depending on the social systems and the level of development of various countries.

The United Nations can play a valuable role in assisting countries in their national energy programs and in identifying the available international sources of technical assistance. A wide variety of assistance for national energy planning is available from the UN system; many developing nations are already deriving significant benefits. However, many participants urged

that the UN system should significantly increase assistance to national energy planning because of its central importance to the development process. Principal ways in which international organizations can assist developing countries include training in the identification of existing energy resources, assistance in developing alternative energy options, and providing information on new techniques for energy utilization. The United Nations can also encourage joint or regional programs of energy cooperation among developing countries, including linking of electrical power grids and cooperation in development of joint hydroelectric sites.

Participants called attention to a number of existing programs of UN agencies to assist developing countries in national energy planning. These include the computerized electric power program analysis of the IAEA to assist countries in assembling information on future electric needs. This program has been of particular value in suggesting how countries might benefit from economies of scale and international electric grids. The Secretariat's Division of Natural Resources offers a wide variety of analytical assistance to member nations seeking to develop an overall conceptual framework for their national energy programs. The Division also sponsors international conferences, including a conference on national energy planning to be held in Stockholm in 1981. The UNDP's assistance is related to specific country projects, and in these efforts its proposed energy fund may have particular utility. The World Bank and the regional development banks (especially the Inter-American Development Bank) are giving increasing emphasis in their lending priorities to energy programs as an integral component of the national development process. As discussed above, the 1981 UN Conference on New and Renewable Energy Sources can offer new information and guidance to nations in this important energy area.

The participants agreed that national energy planning cannot be undertaken in a vacuum. While all countries should strive for reasonable self-reliance, the nature of an interdependent world demands cooperation and coordination with neighbors, the immediate region,

and often countries far across the globe. Energy has traditionally been a factor creating division and strife among nations. It can, as well, be a catalyst for cooperation and unity. The United Nations can perhaps provide its most important energy service by keeping international goals and objectives before member nations as they concentrate on vital national programs.

PRESENT ENERGY ROLE OF THE UN SYSTEM

Despite the current importance of energy, this is a relatively new area for UN involvement. However, within the last decade energy has slowly become an issue of greater concern to the United Nations, which has often provided a forum for discussion. In the process, it has helped member nations better understand the nature of the energy problem and begin to think about ways to deal with it on national, regional, and international levels. In addition to the United Nations and its agencies, other international organizations loosely affiliated with the UN system have become increasingly involved in energy related activities, particularly in the financial area.

UN action on energy is highly decentralized and fragmented. The Secretariat and certain specialized agencies and organs are doing useful, if limited, work. There appears to be little duplication in this work, perhaps in part due to its limited nature.

Participants mentioned the following UN bodies as having particular involvement in energy issues, although the list is not inclusive:

The Division of Natural Resources and Energy (of the Department of Technical Development for Cooperation in the UN Secretariat) provides assistance in formulating national energy policies and strengthening national energy insitutions. The Division supplies information on new energy technologies with the aim of applying them to the needs of developing countries and provides assistance in energy legislation and contracts, with particular reference to agreements on petroleum exploration and development. It also supports technical cooperation activities to requesting governments in the organization of national energy surveys, the assessment of the development potential of specific known energy

resources, e.g., petroleum, geothermal, coal, hydropower, in energy planning, and the assessment of the viability of renewable energy technologies through the support of demonstration projects.

The United Nations Institute for Training and Research (UNITAR) undertakes a considerable amount of useful research and organizes conferences and studies on new energy sources and their utilization.

The United Nations Industrial Development Organization (UNIDO) focuses its energy related efforts on study and technical assistance programs, including assistance in natural gas exploitation, coal development, and studies on hydroelectric power plants. An area of particular involvement for UNIDO is energy conservation in industry.

The International Atomic Energy Agency (IAEA) is currently the only UN-related organization focusing exclusively on a major energy source. In addition to nuclear safeguard responsibilities, the IAEA undertakes a large number of valuable programs of technical assistance for its member nations. One of its most active areas of involvement is assistance in exploration for uranium deposits. It also undertakes studies and conferences on nuclear fuel cycle technologies, information exchange on nuclear power plant technology, nuclear manpower qualification and training, nuclear safety, and nuclear power program formulation and implementation.

The Food and Agriculture Organization (FAO) is undertaking valuable work in technologies for biomass production, wood fuels, improved forest resources management, and agricultural energy consumption and strategies.

The United Nations Educational, Scientific, and Cultural Organization (UNESCO) sponsors conferences and conducts other educational efforts and personnel training for energy production.

An important focal point for UN activities in the energy area is the Committee on Natural Resources of ECOSOC, which also serves as the preparatory committee for the 1981 UN Conference.

The United Nations Development Programme (UNDP) provides valuable financial and technical

Participants (left to right)
First row: Grossling, Ayeni, Maynes, Knote
Second row: Montgomery, Bafi, Chadenet, Ehrman
Third row: van Beuge, Schieber, Stromayer, Poerwanto, Taniguchi
Fourth row: Barnea

assistance to member nations. Its current work in the field of energy includes technical cooperation in petroleum exploration, research and development related to coal liquification projects, training of personnel in hydroelectric and thermal power operation, and promotion of regional cooperation in nonconventional energy. It has assisted in cooperative efforts among developing countries to develop and utilize electric power, including projects in the Mekong Delta and Central America. It has provided direct assistance to national oil enterprises in various countries. The UNDP has also accumulated a great deal of useful data and is building a computerized data base regarding its various projects, from which energy information can be easily derived.

The International Bank for Reconstruction and Development (World Bank) is more heavily involved in the financing of energy development than any other international organization. Its particular area of emphasis is electric power systems expansion. It also focuses on coal mining and on oil and natural gas production and processing. Primary emphasis is given to petroleum and large hydroelectric facilities. In regard to alternative energy sources, biomass is receiving the most attention. The World Bank also takes an active role in technical assistance for energy planning and surveys, and in research and development of new and renewable forms of energy.

While the International Monetary Fund (IMF) does not focus specifically on energy, it has a vital role in managing international financial problems related to energy, as discussed below.

Several other UN agencies and the UN Regional Economic Commissions have some functions related to energy.

Many international organizations outside the UN system, such as OPEC, the International Energy Agency (IEA), and regional development banks, are actively involved in the energy situation.

FINANCING ENERGY DEVELOPMENT: STRENGTHENING THE UN SYSTEM'S ROLE

The energy situation is now a primary factor limiting world economic growth. Therefore, a high priority should be given to obtaining the needed capital investment in energy development and related financing arrangements.

The role of the UN system and other international organizations (regional development banks, etc.) is vital and must grow. While most of the needed capital must come from other sources, international organizations can provide essential leadership and act as catalysts for increased investment from all sources.

Temporary Financing Related to Balance of Payments Problems and Oil Imports

The current accounts deficit of the developing countries is expected to exceed $70 billion in 1980 and $80 billion in 1981. Financing these deficits is a severe problem which strains the resources of both the IMF and the private banking system. Many developing countries, including several in the "middle income" group, are vulnerable because of their heavy debt service burdens.

The IMF does not deal directly with energy. It does provide temporary financing for oil imports and balance of payments deficits. This is short-term financing which provides a limited amount of time for nations to solve internal structural problems and shift to other energy sources.

Current financing from the IMF and private banks provides a breathing spell for 1980 and probably for 1981. Beyond 1981, the severe problems of financing and carrying the burden of short-term debt will increase.

The IMF is actively considering proposals to increase its capital and to shift some of the debt to longer terms, perhaps as long as ten years. It was agreed that these would be helpful steps and would allow more time to solve the underlying problems.

However, it is essential that nations use this time to overcome their internal barriers to development and to develop their own energy sources, and that the UN system provide appropriate assistance. Buying more time will only postpone the financial crisis unless this time is used effectively to create the necessary conditions for development, including energy development.

Financing Technical Assistance and Pre-exploration Work

The UN system is already providing a wide variety of technical assistance, training, studies, and pre-exploration surveys. These activities related to petroleum are discussed above.

Many participants noted with alarm that energy projects are receiving a declining share of total UN system funds for technical assistance and related activities. Changes in allocation of UNDP funds were particularly noted.

It was agreed that a higher priority should be given to energy projects and that a larger share of UN system funds should be allocated to energy.

The UNDP proposal for a $60 million Energy Fund was discussed. This would be a revolving fund for pre-exploration assistance. There was general agreement that this and other proposals for increased funding should be seriously considered.

Financing Energy Development Projects

Development of energy resources will require major capital investment (equity or long-term debt), supplemented by grants to the most needy developing countries. These projects cannot be financed with short-term debt.

Participants noted with approval that the World Bank is increasing its long-term lending for energy development, and suggested that this trend should continue. Within the UN system, the World Bank is by far the largest source of capital for energy development, and its expansion of this role is welcomed and needed. However, the World Bank will continue to be primarily a catalyst for capital investment from other sources: its limited capital in relation to the huge requirement does not permit the World Bank to be the principal source of funds.

It was agreed that the most essential role of the UN system in financing energy development projects is to encourage more capital investment from other sources. These would include multinational corporations, other private investors, all OPEC members, all developed countries, the regional development banks, and other multilateral sources. Many participants commented favorably on the leadership of the Inter-American Development Bank in financing energy exploration and development and on the OPEC special fund and plans to transform it into an OPEC development agency.

It was noted that reports from the World Bank, UNDP, and regional development banks on proposed energy development projects are highly regarded and that these reports often encourage multinational corporations and others to invest in the projects.

Perhaps the most important role of the UN system is to help create the conditions for a major increase in private investment in developing countries' energy projects. Many participants emphasized that most of the needed capital investment will have to come from private sources and that the UN system should increase its efforts to help developing countries create a favorable climate for private investment.

See the discussion above on ways to improve the climate for private investment in developing countries' petroleum projects.

Organizations such as the World Bank and UNDP are in a good position to help multinational corporations and host countries reduce their mutual suspicions and reach satisfactory understandings. Increased use should be made of the "honest broker" or impartial evaluation functions of these organizations.

Mutual reductions of armaments costs would provide many benefits, including the release of funds for investment in energy development. The UN system's role in negotiating and encouraging arms limitation agreements should be intensified.

OTHER ENERGY ACTIVITIES: STRENGTHENING THE UN SYSTEM'S ROLE

All participants accepted the need for a more effective UN role in energy activities. The current decentralization of UN system energy work does not appear to cause much duplication, but it does limit the effectiveness of the UN's efforts. A critical need is for better coordination of work already being done by UN units and related

organizations. Two areas were singled out by participants as of particular importance: collection and harmonization of data and technical assistance.

Collection and Harmonization of Data

There is a distinct need for better energy data collection within the UN system and harmonization of data already collected. As a first step toward this goal, many participants believed it would be useful for the United Nations to identify all UN units and other international organizations that are meaningfully involved in energy activities and are sources of energy data.

Participants noted that energy data include two separate but related areas: (1) statistical information on energy generation and production and (2) information on energy projects in which various UN agencies may be involved. In the area of statistical information, some participants observed that various UN agencies often produce conflicting or incomplete energy information. Further, the UN Office of Statistics (which must rely on national governments) is extremely slow in producing statistical information. The result is that policymakers lack clear information on energy as they seek to formulate or implement policy decisions.

Countries should supply the UN Office of Statistics with more frequent and up-to-date information which can then be distributed throughout the UN system. Of even greater importance would be the creation of an intergrated computerized system within the UN for energy data retrieval and exchange. Such a system could incorporate the activities already under way by the IAEA, UNDP, Division of Natural Resources and Energy, and others and serve as a useful clearinghouse for collecting and disseminating information. It would provide access to the most current and up-to-date information on conventional and new energy sources and would facilitate its early dissemination throughout the UN system and the world community.

To allow greater access to data on energy projects, some participants said it would be useful to organize a computerized information system to which UN agencies involved in energy projects (such as UNDP, World Bank, etc.) would contribute. This should include both

ongoing and completed energy projects. This system would improve coordination and reduce duplication.

Some participants urged that one UN center be made responsible for publishing and circulating brief summaries of successful energy projects anywhere in the world, including instructions on how to obtain more complete information if desired.

Some participants observed the need for more compatible data within the UN system and noted that UN agencies resist discarding their individual systems and adopting standard systems for energy information. In addition to collection, there is a need for evaluation and interpretation of data. It was suggested there is a need for checking the validity of collected data. For progress in both harmonization and evaluation of collected energy data, some participants believed it would be necessary to give centralized responsibility for energy data to some office within the UN system.

Finally, some participants cautioned that in developing an adequate UN data capability, the United Nations should not duplicate activities of others. The United Nations should use energy data available through professional organizations, regional organizations, and private and state-owned entities.

Technical Assistance

Another very important area in which the UN energy role should be strengthened is technical assistance to developing countries. Several UN agencies and related bodies are already involved in providing technical assistance in the energy area, notably the World Bank, UNDP, the UN Division of Natural Resources and Energy, and the specialized agencies. Despite these efforts and valuable assistance offered by regional development banks, most participants believed improvements should be achieved in several areas.

There is a need for UN assistance in manpower training for the energy sector of developing countries. Many developing countries lack experts trained in energy technology appropriate for their needs. The United Nations and related agencies can also help train developing

country experts to be aware of, and better utilize, available UN services in the energy sector.

Most participants strongly supported strengthening the staff of trained experts within UN agencies offering technical assistance in the energy area. It was suggested that sufficient technical expertise in the energy area is not now present in many UN units. Some principal exceptions are the World Bank; the IAEA, which provides very useful technical assistance in the nuclear field; and the Division of Natural Resources and Energy, which despite limited manpower maintains a significant program of technical assistance.

According to this view, the UN system needs additional expert staff to evaluate the energy needs of developing countries and information received from outside the United Nations, and to formulate programs which will provide real benefit. There is a distinct need in the UN system for a small but highly trained group of energy experts which could, on request, help plan and implement energy projects in developing countries. Many developing countries need this assistance, and it was suggested that the United Nations has a responsibility to better organize its limited funds and human talent to develop an internal capacity to achieve this purpose. However, some participants said it would be more effective to hire outside consultants and experts when needed to supplement the UN system's limited staff.

Finally, several participants mentioned the relationship between strengthening the United Nations' ability to offer technical assistance in the energy area and the forthcoming Global Negotiations. It was suggested that, as energy is an important element of the negotiations, a major new UN technical assistance initiative in the energy sector is likely to be taken only in the context of and following these discussions.

EVOLUTION OF UN ENERGY RELATED INSTITUTIONS

The development of UN institutions adequate for the UN system's growing energy role is a sensitive and complex issue. Participants were divided in their views on

feasibility and desirability of a new UN energy institution. This would require more centralization and possibly a reduction of staff and functions of existing UN organizations.

Most participants accepted the need for greater coordination of UN energy activities (particularly in the collection and dissemination of data) and recognized that the principal resistance to coordination comes from the UN agencies. It was also observed that the Administrative Committee on Coordination (ACC) is providing minor assistance in coordinating energy activities, but most believed it is not able to coordinate the United Nations' energy activities. Some participants suggested the needed coordination could best be achieved within the UN Secretariat.

While some participants would limit further strengthening of UN energy institutions to coordination, others supported more far-reaching changes. Some suggested creation of a consultative unit within the UN structure to coordinate and focus available financial resources for technical assistance to developing countries in the energy sector. This unit could bring together principal UN system organizations involved in funding energy projects (primarly the UNDP and the World Bank) along with other UN agencies, the Secretariat, and interested governments. The objectives would be to facilitate consultation and to use available funds effectively to increase national energy capabilities. This consultation could help prevent duplication and enhance cooperative efforts. It would provide an impartial focal point within the UN system where rational and productive energy projects could be discussed and implemented. National governments and organizations interested in energy projects would have a mechanism within the UN system through which funds could be directed.

This unit, it was suggested, could attract both the oil producing and industrialized oil consuming nations in a mutual effort to assist the developing countries. It was emphasized that a consultative unit could be established without creating a new bureaucratic institution. Its purpose would be to mobilize already existing funds (rather than creating a new fund) and use these

resources for energy projects where a consensus exists. Some participants pointed to the Consultative Group on International Agricultural Research (CGIAR), an international association of countries, international organizations, and private institutions, as an appropriate model.

A second suggestion would create a new energy agency or unit within the UN system, having a special focus on the needs of developing countries. This unit would encompass most existing energy related activities of the UN system. Areas of responsibility for the energy unit might include integrated data collection and harmonization, hosting international conferences, and undertaking research and studies. The energy unit might also be responsible for energy related technical assistance to developing countries.

Some participants observed that while creation of a consultative mechanism to channel existing funds in the energy area is a feasible goal, creation of a new UN energy unit is far less so. However, in the longer run, an international energy unit within the UN structure may become necessary and achievable. It was emphasized that progress in the Global Negotiations and a successful 1981 UN Conference on New and Renewable Energy Sources could set the stage for significant evolution in UN energy machinery.

CONCLUSION

The world has already begun the transition away from major dependence on petroleum to greater reliance on other energy sources. The second transition, from nonrenewable to renewable energy sources, is in its very early stages.

Effective management of energy is essential to achieve steady, worldwide economic growth with increased opportunity for all. The energy problem is complex and difficult.

There is now a great need and a great opportunity for the United Nations to coordinate, aid, and encourage positive energy action by national governments, the private sector, and international organizations. Attention should be focused on strengthening and coordinating the UN system's energy role.

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Chairman's Statement

Opening Remarks
THE UNITED NATIONS AND ENERGY MANAGEMENT
by C. Maxwell Stanley

Energy is the lifeblood of modern civilization. It powers the machines that lift burdens from human backs. It speeds people and goods from place to place. Energy activates communications systems, bringing the news of the world into our homes. It lights our homes, our factories, and our streets and adds comfort and convenience to our daily living. Pause for a moment, if you will, and reflect on what life would be this very day were a 24-hour ban imposed on the use of petroleum, natural gas, and electricity — the modern forms of energy.

Indeed, energy is the lifeblood of modern civilization, so much so that per capita energy consumption of a country is a key indicator of its stage of development. A direct correlation exists between energy consumption and economic growth. Hence it is normal and necessary that nations seek adequate, secure, and reasonably economical sources of energy. We do well to note the crucial importance of energy in our lives as we approach the topic of "The United Nations and Energy Management."

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Transition

As a professional engineer associated for a half century with electric power supply, I am fully cognizant that energy matters are in a period of transition. Until the oil embargo of 1973, energy sources and technology were taken for granted. Given enough money and time, new facilities for electricity were easily provided. Facilities for producing and delivering petroleum and natural gas were likewise easily provided. Energy supply was the responsibility of private sector utilities and oil companies, or of counterpart agencies in socialist states. Governmental political involvement was marginal; users complacently took for granted that energy to meet their needs would be available. The 1973 oil embargo awakened everyone to the fact that energy can no longer be taken for granted. Today it is a near-crisis problem.

The cost of energy has taken a quantum leap. Even before the 1973 oil embargo, costs of electrical energy were rising appreciably. Since 1973 costs of electrical energy have continued to rise and petroleum and natural gas costs have increased manyfold. The investment required to construct power plants, drill oil wells, and distribute energy products has risen sharply. Further increase is inevitable as remote and difficult oil and gas fields are developed and more sophisticated and costly processes are used to provide electrical energy. The days of cheap energy are gone.

It now becomes increasingly important to move from old dependable energy sources to new ones. Petroleum and natural gas resources are finite. Forests and woodlots in many countries near exhaustion. In most countries the larger, more economical hydroelectric sites have been developed. Nuclear power, the hope of the 1960s, continues to encounter safety problems and to raise the specter of more nuclear weapons in more hands. New technology is needed to make effective use of new and renewable energy sources.

It is no wonder that in this period of transition, energy is viewed as a critical issue by users, suppliers, and nations.

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Action Areas

What must be done to give greater assurance that the world's current and future energy needs will be met? Some understanding of the answer to this question is a prerequisite to examination of energy management in general and the role of the United Nations in particular. To this end I outline four action areas wherein we must deal with near-term and longer-range energy problems.

The first action area is the near-term supply and use of petroleum resources. Dependence upon them will remain high in the near term, despite successful conservation efforts and accelerated development of alternative sources. The members of the Organization of Petroleum Exporting Countries (OPEC) and the oil-importing nations have common interests in improving current strained relations. Supplier nations, seeking increased revenues from their oil resources, desire to limit production to assure availability over a longer period of time. Importing nations want dependability of supply and, if prices cannot be stabilized, at least a more predictable and gradual pattern of price increases. A related problem concerns relief for oil-importing developing nations from the unfavorable balances of payments resulting from the high cost of petroleum. Resolution of problems in this action area are urgent and pressing.

A second action area, the development of new and renewable sources of energy, warrants a major commitment of resources. The forthcoming 1981 UN Conference on New and Renewable Sources of Energy highlights the importance of this endeavor. Assembly Resolution 33/148 confines the scope of this conference to such sources as solar energy, geothermal and wind power, tidal power, wave power and thermal gradient of the sea, biomass conversion, fuelwood and charcoal, peat, energy from draught animals, oil shale and tar sands, and hydropower. The state of the art varies greatly among these energy sources. Technology for hydroelectric and geothermal projects to produce electrical energy is generally adequate. Technology for wind power generation of electrical energy is fairly well advanced.

Technology for developing power from the sea — whether from waves, tides, or thermal gradients — is primitive. Technology for utilizing solar energy is reasonably adequate for water and space heating and other low-temperature uses, but technology for generating electrical energy from solar energy leaves must to be desired. Technology for developing substitutes for oil or gas from oil shale and tar sands and from biomass is developing rapidly. Use of peat, animal dung, and similar wastes, as fuel for heating would not seem to require further research. New or renewable potential energy sources deserving of attention but excluded from the UN Conference agenda include fusion for electrical energy generation and hydrogen as a substitute for gasoline.

Answers to future energy supply must be found in this action area. Substantial time will be required, however, before these sources can be researched and developed to provide an important part of total energy requirements. The exceptions to this are the uses of hydroelectric and geothermal electric power and the use of low-grade solar energy, fuelwood, and charcoal for cooking and heating. While it is important to stimulate development of alternative sources, it must be recognized, however, that it will be many years before they will provide a substantial portion of the world's power requirements.

Expansion of conventional energy sources, therefore, is a third action area of immediate importance. This calls for accelerated programs of exploration and drilling to locate and develop greater reserves of petroleum and gas in order to prolong the availability of these convenient but finite energy sources. Increased demands for electrical energy must largely be met by available technology. In some countries this will mean additional hydroelectric projects, including so-called mini plants. Coal will be used increasingly in steam electric plants, both new plants and retrofits where coal will replace oil or gas. Nuclear electric plants will be added in many countries.

Conservation aimed at elimination of waste and more efficient use of energy is a fourth action area. Rising energy costs, together with educational efforts, are

already reducing consumption of oil and gas and slowing growth of consumption of electrical energy. The greatest opportunities for conservation are in the industrialized countries. Developing countries that continue their economic growth will inevitably increase their energy needs, but conservation efforts will be beneficial too. Conservation is not an answer to power supply, but it can gain time and lessen energy pressures.

Simultaneous action in these four action areas is essential. Although work is already going on in each of them, the task is to accelerate and expand these efforts.

Actors

Energy has become a popular issue. Hence the already numerous organizations long concerned with energy matters are being joined by newcomers. Actors in the energy area include private sector organizations, national governments and their subdivisions, and international organizations.

The private sector has long furnished the leading actors in the energy field. Until recently the private sector, plus nonpolitical agencies or authorities of socialist states, have dominated the research, the manufacture of equipment, the design and construction of facilities, and through utilities and oil companies, managed and operated the production and distribution of all forms of energy. These private sector organizations — again including socialist state agencies and authorities — have important roles to play in each of the four outlined action areas.

The emergence of national governments as principal actors in energy matters is recent, but expanding. National governments have, since World War II, been the principal organizations involved in nuclear research. They, or their subdivisions, have long established regulatory and trade policies affecting the electric, oil, and gas industries. The impact of OPEC actions upon national economics has led to much greater involvement of national governments in energy matters. The OPEC nations have not only set petroleum prices but, in those countries where private oil company properties have been expropriated, they are involved in operations.

Without question, governments of both petroleum suppliers and petroleum users will be increasingly involved in energy matters.

The emergence of international organizations as participants in energy matters has been of even more recent origin. Longer standing activities have included the Center for Natural Resources, Energy, and Transport of the UN Secretariat; the International Atomic Energy Agency (IAEA); and the World Bank. More recently, other agencies have become concerned with limited facets of the energy problem: for example, the United Nations Conference on Trade and Development (UNCTAD); the United Nations Environmental Programme (UNEP); the United Nations Industrial Development Organization (UNIDO); the Food and Agriculture Organization (FAO); the United Nations Development Programme (UNDP); the United Nations Educational, Scientific, and Cultural Organization (UNESCO); the United Nations Institute of Training and Research (UNITAR); the Committee on Natural Resources (CNR) of the Economic and Social Council (ECOSOC); and various UN regional commissions.* The UN General Assembly has called the 1981 UN Conference on New and Renewable Sources and is structuring a program of Global Negotiations to begin in early 1981 with energy as one of the five areas of proposed negotiations.

Factors

To repeat, energy is not only an important issue — it is also very popular. As we search for an optimum energy role for the United Nations, it is important to identify certain factors that may help to define the function the United Nations can beneficially perform.

Each nation is responsible for determining its power policies. This is true whether the nation is a supplier or an importer of energy, whether it has substantial or minimal technological and energy resources. Only national governments can make energy decisions, implement energy programs, and accept or reject proffered

*See UN document entitled "Cross Organizational Analysis of the Energy Programs of the UN System for the Specific Activities in the Energy Field of UN Agencies and Organizations."

assistance. No nation, however energy poor, is likely to abdicate these vital functions to global institutions. Hence the energy role of the United Nations must be secondary, but supportive. Some nations will need little assistance — others a good deal.

Recognition that energy management consists of several separate, though related, facets, each having its own time frame, is important. Limiting petroleum and natural gas consumption while finding additional sources and developing substitutes is the most urgent facet. Time is of the essence because petroleum and natural gas resources are finite and current dependence upon these energy sources is so great. Development of alternative processes for generating electrical energy is less urgent because reserves of coal and uranium, while finite, are adequate for a much longer period, certainly more than a hundred years. Coal-fired and nuclear generating plants, supplemented by mini and major hydroelectric plants can provide electrical energy requirements for many years, even as electrical energy increasingly becomes a substitute for petroleum and gas. The third facet concerns such sources as solar, wind, fuelwood, biomass, and animal power, which have both near-term and longer-range potential. These sources are particularly attractive in developing areas where energy usage is not great and is scattered. In the longer range these sources must be looked to as substitutes for oil and gas and, ultimately, for coal and uranium for generation of electrical energy.

Another important factor is recognition of the magnitude of resources required for research to find acceptable oil and gas substitutes. Exploration and development of additional petroleum reserves is costly. Technology for producing oil and gas from oil shales and tar sands is yet experimental; required investment for pilot plants is enormous. Progress in this area is most likely to come from highly industrialized nations having the greatest stake in finding substitutes, advanced scientific capability, and substantial monetary resources. While alcohol for partial replacement of gasoline is now produced to a limited extent with present technology, substantial research and investment is required to achieve major production.

The special problems of many developing countries is a factor worthy of recognition. All developing countries share with developed nations those energy concerns peculiar to transportation, industry, and urban communities. Most developing countries, however, also have subsistence sectors where energy usage is minimal and energy sources are primitive. These are areas where solar, wind, fuelwood, and biomass sources offer near-term benefits. Much of the required technology is available. Additional technology should result from intensified attention to research and application largely undertaken in the developing countries.

Many developing countries will need technical and financial assistance to create and implement national energy programs, including indigenous research activities. Such assistance can only come from international organizations and industrial nations. It is in the interests of all concerned — developing nations, developed nations, and OPEC countries — that adequate assistance be provided as an important part of an overall program of energy management. Developing countries can and should make a contribution and, moreover, they have energy problems unique to their stage of development.

Private sector research institutes, manufacturers, and utility and oil companies — including their counterparts in socialist states — must play an important role in energy management. They have most of the scientific, technical, and managerial capability in energy matters. Failure to structure the management of energy to take advantage of their potential will inevitably slow the process of lessening dependence upon petroleum and gas and increasing reliance upon renewable sources.

UN Role

Against this background we now approach our conference task — namely, to examine the broad aspects of energy management and propose an optimum role for the United Nations. Energy management, stated simply, is the planning and implementation of adequate action in each of the four action areas described below:

1. Resolution of near-term problems regarding petroleum supply;

2. Development of new and renewable energy sources;
3. Reliance upon conventional sources until replaced by new and renewable sources; and
4. Conservation of energy.

This is a gigantic and complex undertaking. Every nation is involved to some degree. A multiplicity of organizations ranging from oil companies, utilities, manufacturing companies, research institutes, and others — mostly in the private sector — are already involved. Numerous international organizations — regional as well as global — are active in some phase.

Numerous alternative UN roles have been suggested and several of them will no doubt be proposed during our deliberations. They range from doing about what is now being done by the United Nations and its agencies to creation of an all-powerful global unit managing all facets of energy supply.

Certainly there are functions of energy management best handled by international organizations. Emphasizing energy matters, collecting and distributing energy data and information, stimulating research, and coordinating technical and financial assistance to developing nations may be proper examples. Undoubtedly, resolution of near-term problems regarding petroleum supply (Action Area 1) requires a multinational approach which may or may not be accomplished by the proposed UN Global Negotiations.

To propose too grand a role for the United Nations would be a disservice not only to energy management but also to the United Nations. The United Nations has neither the authority, the technology, nor the human and financial resources to solve the crucial energy problems of the next few decades. These problems can only be managed by the public and private sectors of the 152 member nations of the United Nations. Hence the role of the United Nations and its agencies should be a supportive one. Therefore, the optimum UN role lies closer to the current levels of activities than to a more grandiose pattern. Our task in the next few days is to search for that optimum role, and having reached tolerable agreement upon the role, we should look to the organizational structure — mechanisms and machinery — that is needed to coordinate energy management activities of the UN family. Examination of the need for new organization, modification of existing organization, and realignment of functions among existing organizations would be included in this task.

In closing, I repeat that energy is the lifeblood of modern civilization. Difficult and complex energy problems are here to stay. Benign neglect will not make them wither away. The world community's failure to deal with them effectively and fairly will be disastrous; the economic well-being of every nation would be threatened. Therefore, I express the hope that our deliberations will result in a better understanding of the magnitude of energy management and some specific recommendations as to the role the United Nations should play. If we can do this, we will make a contribution to the solution of one of the most critical problems facing the world community.

OBSERVATIONS*

Chairing the conference on "The United Nations and Energy Management" was an informative and satisfying experience. The conference participants brought to the deliberations great and varied knowledge and expertise regarding the complicated global energy problem. Their insights contributed to the success of the conference and to the high quality report prepared by the rapporteurs. These Observations present several perceptions which I believe emphasize and augment the rapporteurs' report.

Magnitude

Perhaps my most vivid impression of the week's deliberation concerned the staggering magnitude of the transition problems facing the world community. Even the early stages of the first transition aimed at lessening dependence upon oil and natural gas call for a monumental commitment of technology, money, and political will. Meaningful progress toward the ultimate goal—complete reliance upon renewable energy sources —calls for even greater commitments.

Few who are actively engaged in the energy field fully realize the magnitude of the undertaking. Political leaders and their constituencies the world around are even less aware of the challenge; too many remain confident that the problem will somehow go away.

Energy Planning

The basic responsibility for each country's energy planning rests with its national government; this fact cannot be overemphasized. Energy planning will be successful only when conducted in the context of a nation's development and growth objectives. It must take into account the country's present and potential energy resources and its culture, objectives, and standards of living, as well as its stage of economic development. Planning assistance may be obtained from outside, but the basic responsibility rests on each national government.

*These Observations, prepared by the chairman following the conference, reflect, in some instances, discussions at prior Stanley Foundation conferences concerned with energy and development matters.

Private Sector

Private sector organizations — including socialist state agencies and authorities — have most important roles to play in the accomplishment of energy transition. These organizations possess the capability to carry out the research, manufacture the equipment, construct the facilities, and manage the energy systems. The private sector has much to contribute to the initiation of research in connection with new and renewable energy sources, research that should be partially based in developing countries. Moreover, it appears certain that many developing countries must look to the private sector for substantial assistance in financing energy transition facilities. Those developing countries which create the conditions and attitudes that facilitate private sector support are most likely to be the ones making the greatest progress in transition from dependence upon oil and natural gas.

Role for the United Nations

Our conference discussions revealed the many worthwhile energy-related programs of the several agencies operating under the UN umbrella. Undoubtedly, there is need for appreciable expansion of these programs. Our deliberations did not, however, develop any strong arguments for the creation of an overall UN energy organization. They did, however, emphasize the need for ongoing coordination and centralization of data on energy matters and projects. The creation of a consultive unit within the UN structure, similar perhaps to the Consultative Group of International Agricultural Research (CGIAR), appears to have merit.

The UN role can only be supportive of the individual and collective efforts of those addressing the global energy problem. Perhaps the United Nation's most important functions can be to stimulate global awareness of the seriousness of energy problems and to lend assistance to nation-states seeking to develop adequate national energy programs.

References

Other publications of the Stanley Foundation which deal generally with the topic of energy are:

Occasional Paper 23, "The International Nonproliferation Regime" by Joseph S. Nye, July 1980

Vantage Conference Report, "Nonproliferation: 1980s," January 29-February 3, 1980

Occasional Paper 20, "Multinational Institutions and Nonproliferation: A New Look" by Myron B. Kratzer, October 1979

Twentieth Strategy for Peace Conference Report, "UN Conference on Energy" and "Nuclear Policy for the 1980s," October 25-28, 1979

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Vantage Conference Report, "Energy and Nuclear Security in Latin America," April 25-30, 1978

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Other recent publications of the Stanley Foundation are:

Report of the Eleventh Conference on United Nations Procedures, "Global Negotiations and Economic Development," May 1-4, 1980

Occasional Paper 22, "Chinese Policies Toward Limiting Nuclear Weapons" by Amos Yoder, March 1980

Occasional Paper 21, "The Congressional Foreign Policy Role" by Clifford P. Hackett, November 1979

Twentieth Strategy for Peace Conference Report, "Oil and Peace in the Middle East; Development Strategy for the 1980s; Deterrence and Detente; News Media and Foreign Policy," (5th and 6th topics listed above), October 25-28, 1979

Fourteenth Conference on the United Nations of the Next Decade, "International Development Strategy," June 24-29, 1979

All publications are available free of charge from the Stanley Foundation.

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